EAU

Intelligence, Surveillance, and Reconnaissance Management Directorate

SIWG-10

Daryl Robertson
WR-ALC/LXAS

This briefing is unclassified

communications
Integrated Systems

Overview

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- **Modification Description**
- **Block Diagram**
- **Interface Issues**
- **Schedule**

Elint Antenna Upgrade (EAU) Modification

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- **PME2/GCP modification only**
  - **Replaces existing RA-2/RA-2G Elint Array RAS-1R**
  - **Modify 3 CCAs in RAS-1R baseline LRUs**
  - **Modify GCP Ground S/W baseline**
- **Program restructure in process**
  - **Field 2 vs 4 EAU kits**
  - **5 of 7 RAS-1Rs retain legacy array**
- **Solves VVI issues**
  - **Legacy front end designed in 1988, number of VVI issues with MIC assemblies, corrosion (solder), RF Synthesizer, Polarizer panels**
- **Improves performance**
- **Joint program with ADV-Sensor HBSS**
  - **Array is common, electronics are not**
- **First Delivery to field in 3Q FY05**

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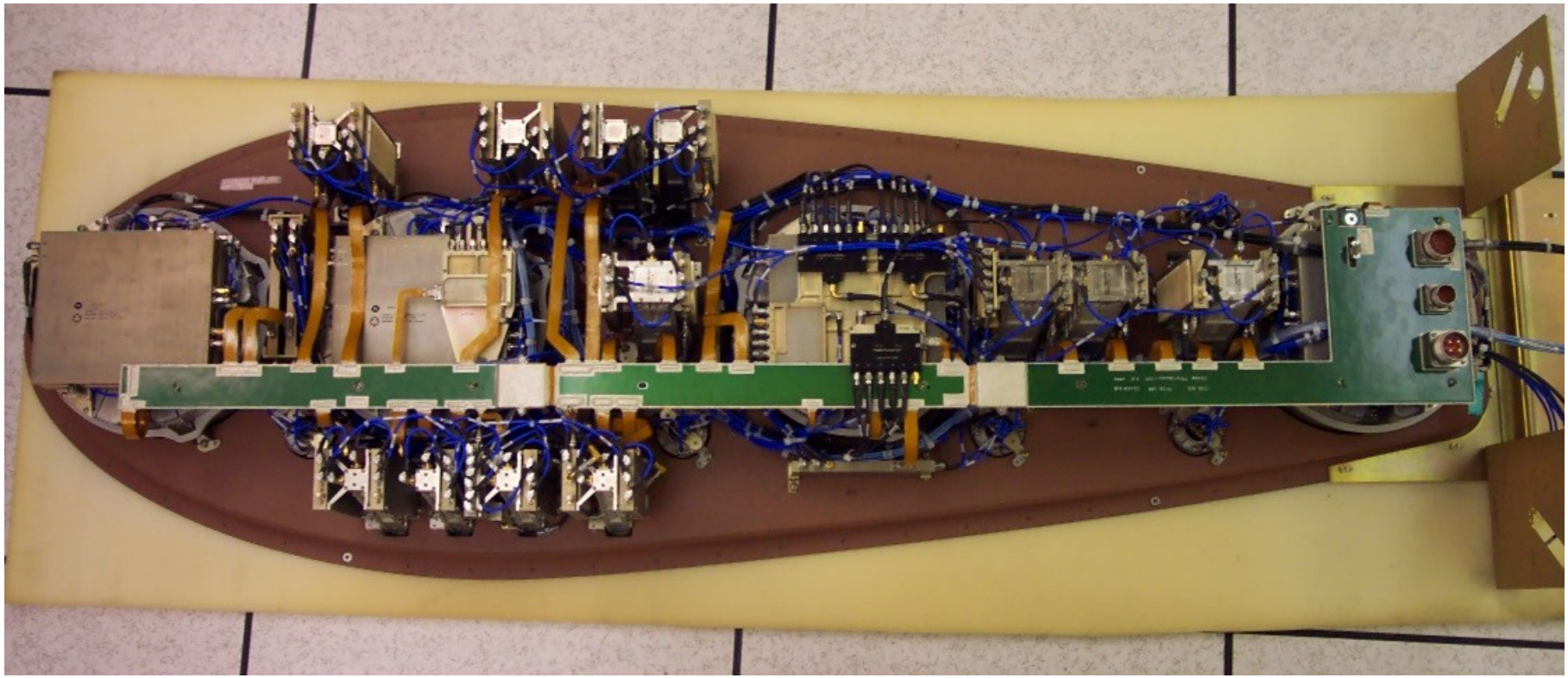

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Rodney Jaeger
WR-ALC/LXAS

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RAS-1R/EAU Performance / Operational Improvements

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Increased situation awareness

- **Wide (2X) Instantaneous BW**
- **Improved revisit times**

Light weight

- **Integrated antenna & MIC electronic modules**
- **Coming in under current weight allocations**

Emitter Detection/Measurement Improvements

- **8-15 dB improved sensitivity relative to legacy arrays for side lobe collection**
- **Dual-pol receive antennas provides sensitivity improvement of H/V pol emitters relative to legacy array**
- **Colinear arrays support improved ambiguity performance and geolocation accuracy**
- **Measurements provided in support of emitter polarization determination**

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Block Diagrams

EAU Impacts

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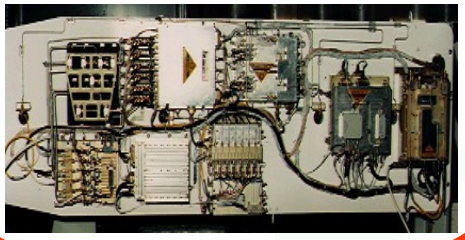
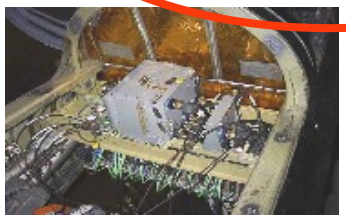


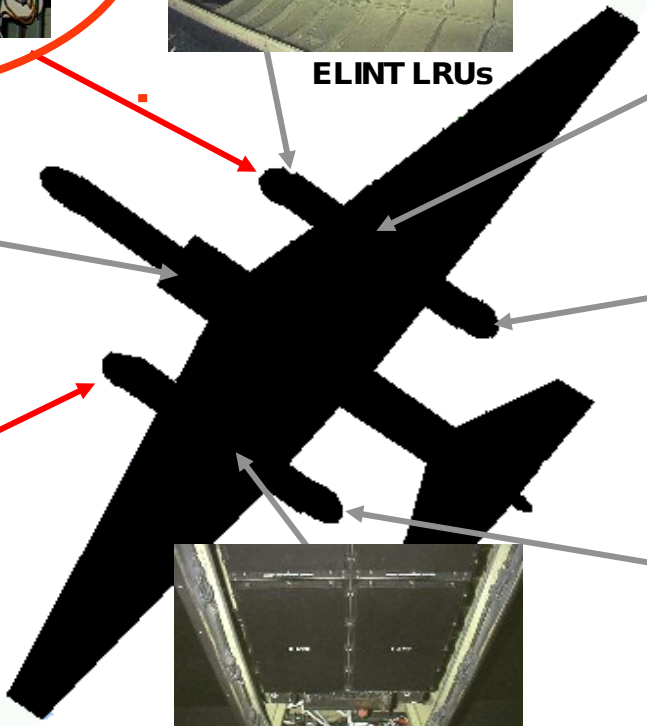
RF Pallet

ELINT LRUs

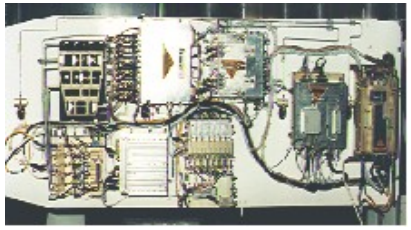
Liquid Cooled Rack System



RFD Preamp



Link Interface/ATM Switch



RF Pallet

ELINT LRUs

Liquid Cooled Rack System

Preselects RFD

RAS-1R/EAU Interfaces / Block Diagram - Internal

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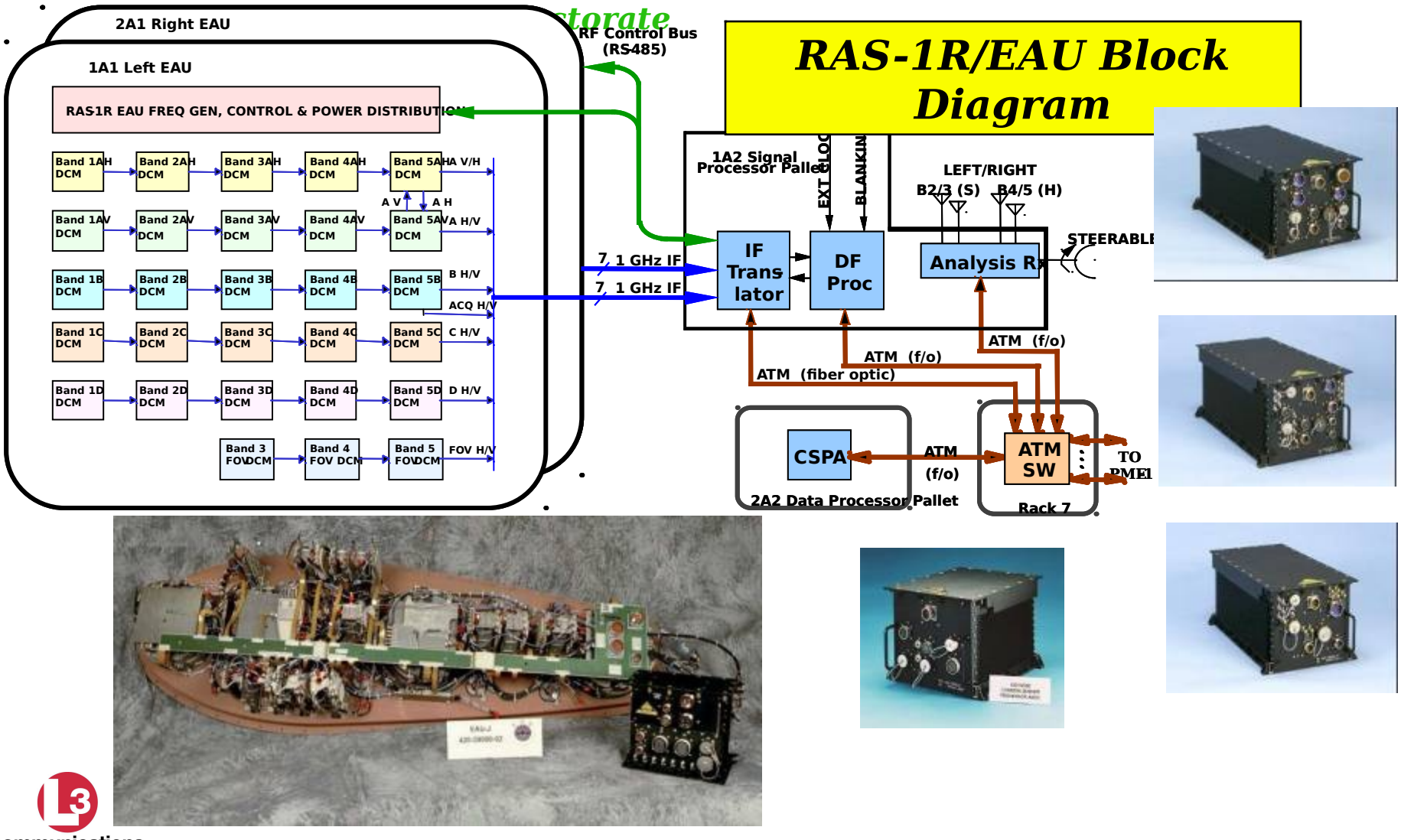

RAS-1R/EAU Interfaces / Block Diagram - External

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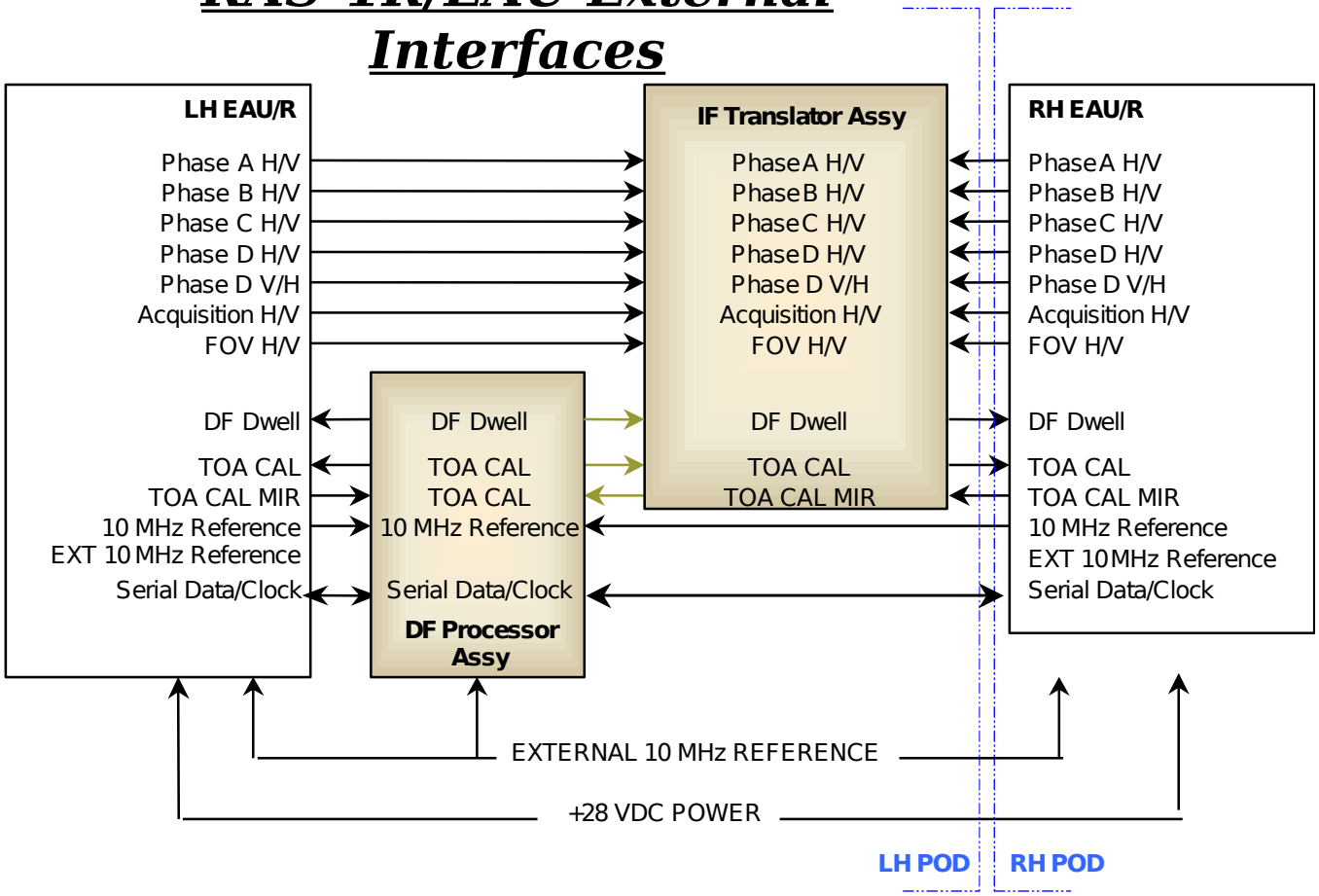
RAS-1R/EAU External Interfaces



Baseline RAS-1R System
(Not a part of EAU-R)

RAS-1R/EAU Command and Control

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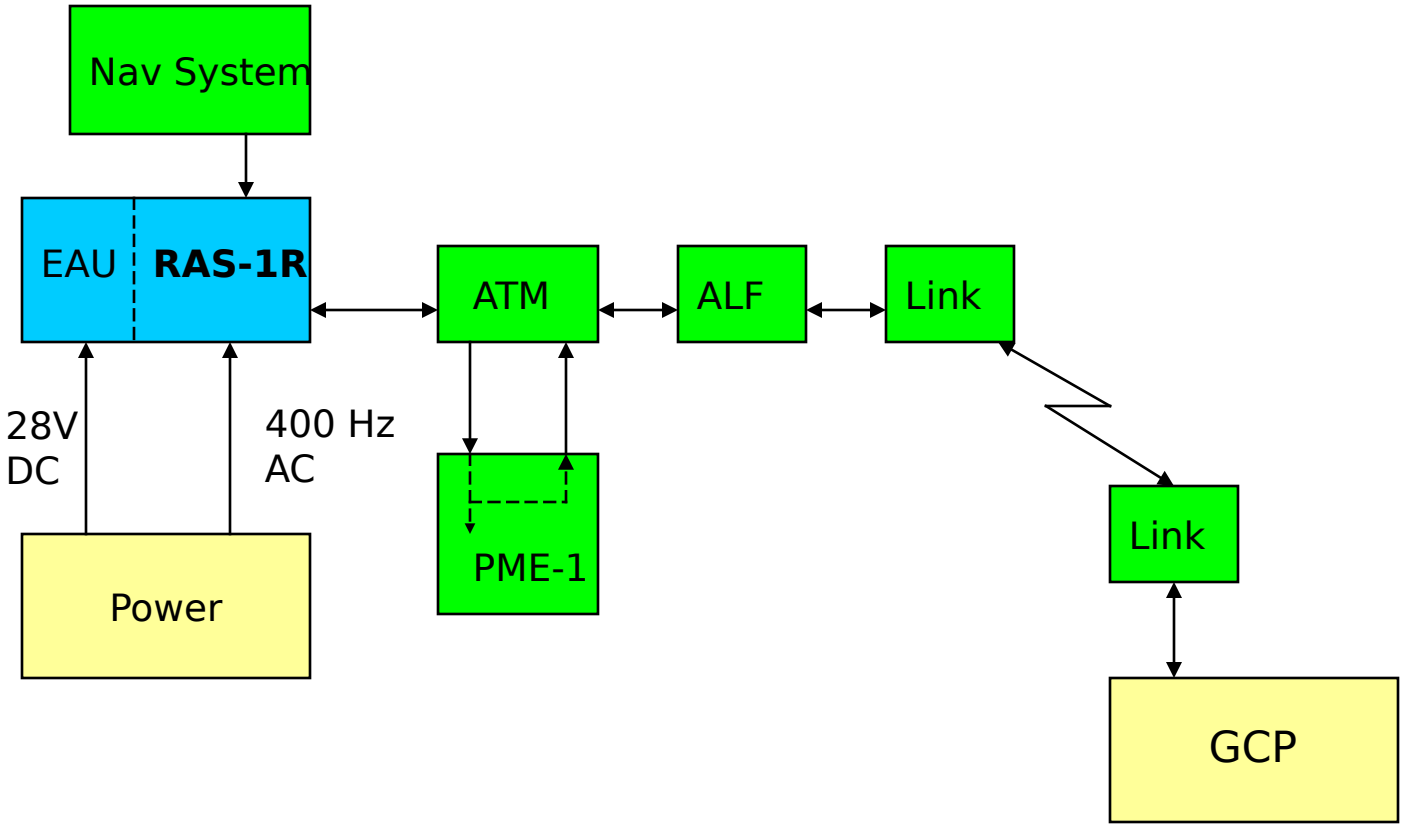

GCP Interface

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- **Controlled by RAS-1R/GCP IRS 410-50005**
  - **Rev C released June '04**
- **Changes affecting GCP control and processing**
  - **Test Signal Generator Controls have a few differences**
  - **Receive Polarity selection added**
  - **Simultaneous polarization added**
  - **WRR qualification deleted/XPOL qualification added**
  - **Expanded PDWs added to support polarization reporting**
  - **AOA algorithm changes for EAU antenna layouts**
  - **Band breaks are different**
  - **BIT reporting changed to support EAU hardware**
  - **Calibration commanding/reporting changed to reflect more bands**

Size Weight and Power

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- **Conforms to Pod Mechanical interface**
- **Weight - Less than Specification**
  - **EAU-R Specification 113 lbs, Actual Approx. 97 lbs**
  - **NOTE: Weights Do Not Include GFE Radome (Approx. 19 lbs)**
- **Power - Less than Specification**
  - **Requires 28 VDC (No AC Required), Using Power Management to Minimize Consumption**
  - **EAU-R Maximum Power Consumption Specification < 500W per Side, Measured < 300W**

Interface / Integration

EAU Program / Integration Issues

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- **Modified Group B Cabling Required – separate contract with LM Aero**
- **Pod Forebodies**
  - **Pod Forebodies need to be modified for RAS-1R/EAU, first set needed approx. 9/1/04 (prior to chamber test)**
  - **18 Forebodies exist - 15 located**
    - **13 in systems (3 RA-1, 3 RAS-1A, 7 RAS-1R)**
    - **1 at Site 2 – CSPA only & dedicated to aircraft DF cals**
    - **1 at L3-COM – Modified for advanced sensor**
- **(GFE) Radome Insert Repair**
  - **To date, Loose inserts on 5 Radomes. 4 repaired by LMA and returned to L-3Com. SN 3 completed test at L-3Com.**

EAU Program / Integration Issues (cont'd)

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- 6 LO/TSG currently operational (SN 2, 3, 4, 5, 6 and 8)
  - LO/TSG S/N 10 due August 2004 (Synthesizer MIC in repair, then calibration, then ATP)
  - 8 Delivered, Two Modules in vendor repair, SN 7 and 9
  - One Module probable return for repair, SN 1
- Coordination of GFE
  - NILEDRIVE integration executed in parallel, flight tested together
- PME-1 Lite needed for flight test
  - SDA (Steerable Dish) Capability needed for NILEDRIVE

Status/Schedule

RAS-1R / EAU-R Status

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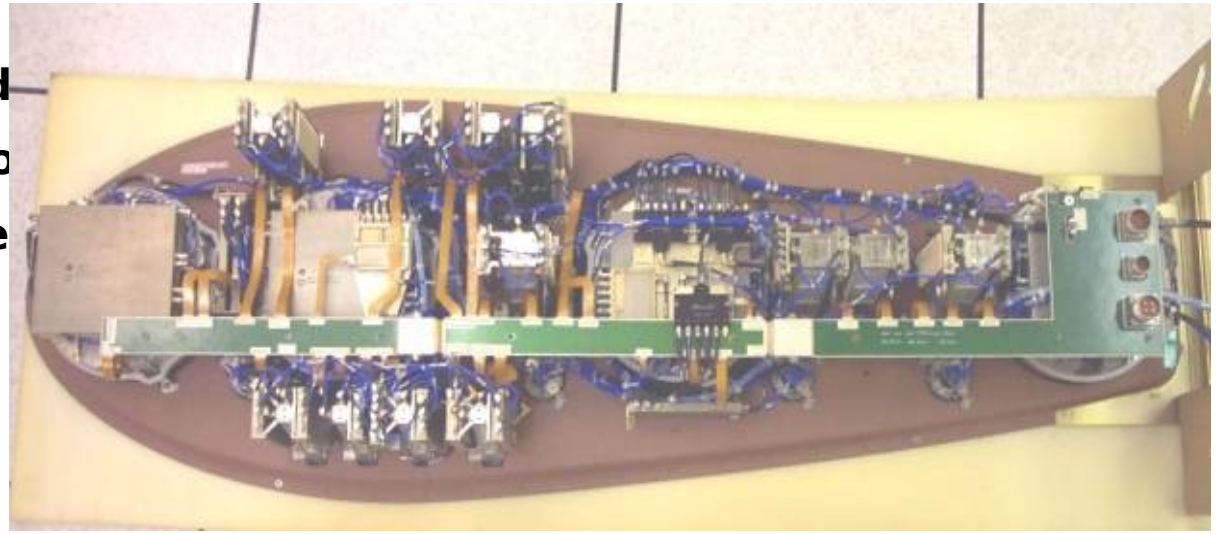
- **EAU-R Initial Build**
  - **EAU-R #1 & EAU-R #2 provided to Interface**
  - **EAU-R #3 completed chamber test. Data analysis in work.**
  - **EAU-R #4 awaiting chamber test**
  - **EAU-R #5 awaiting FGCA**
  - **EAU-R #6 – EAU-R #8 built to part shortages**
- **EAU-J Initial Build**
  - **Two sides delivered**
    - **One side in retro**
  - **Third side build / te**



RAS-1R / EAU-R Status (cont'd)

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- **EAU-R Interface**
  - **RAS-1R/EAU-R Mission Software (MSW) I&T**
    - **MSW Inc #1 FTV completed 3/11/04 (scheduled for 3/22)**
    - **MSW Inc #2 FTV completed 7/21/04**
  - **NRE Cabling complete**
  - **New Qual Dist Module, Qty 2, Designed, Built, and Tested**
  - **Shop Maintenance / Flight Line NRE in work**
  - **Interface Kits 2 – 4 material procured**

RAS-1R / EAU-R in

EAU-R #1 and #2 Integrated with PME-2 RAS-1R

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RAS-1R / EAU-R Documentation

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- **EAU Interface Control Document**
  - **Rev 05 released 4/29/04**
    - **Addressed last of working group action items, LMA questions**
    - **Provided to LM Aero, no known issues**
- **RAS-1R AES/GCP ICD**
  - **Rev C released 6/08/04**

NILEDRIVE and RAS-1R/EAU-R Combined Schedule

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• Niledrive Test Readiness Review	• 13 Oct 04
• EAU System #1 Integration	• 17 Aug 04
• Niledrive/EAU System #1 Integration	• 13 Oct 04
• Niledrive/EAU System #1 Lab ATP	• 11 Nov 04
• Niledrive/EAU System #1 Environmental ATP	• 22 Nov 04
• EAU System #1 Radiated ATP	• 16 Dec 04
• Niledrive/EAU System #1 Delivery to Palmdale	• 25 Jan 05

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